

# The Genus *Littoridinops* (Mesogastropoda: Hydrobiidae) in New England

by

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*Abstract.* The hydrobiid snail genus *Littoridinops* is represented in eastern North America by at least three species. One species, *Littoridinops tenuipes*, has been reported northward along the Atlantic coast to at least extreme southeastern New York. However, the taxonomic status of the northern populations of *L. tenuipes* remains unclear because of differences in the verge of New York specimens, and the generally accepted northern range limit of confidently identified specimens of *L. tenuipes* is Georgia. Snails identified as belonging to the genus *Littoridinops* were recently collected in coastal fresh and brackish waters in northeastern Massachusetts, thus extending the known range of the genus farther north. On the basis of shell characters and verge and radular morphology the populations are identical with *L. tenuipes*. The status of New York populations is still unclear due to the odd appearance of the verge, which may be either an artifact of preservation or representative of an as yet undescribed species.

## INTRODUCTION

THE HYDROBIID genus *Littoridinops* Pilsbry, 1952, contains at least three species of fresh- and brackish-water inhabiting snails that live in subtropical and temperate regions of eastern North America (TAYLOR, 1966). Only one species, *Littoridinops tenuipes* (Couper, 1844), has a range that includes both climatic zones. However, the northern extent of the range of *L. tenuipes* has been in question since PILSBRY (1952) described the subgenus (now genus) *Littoridinops* to accommodate the distinctive *L. tenuipes*. PILSBRY (1952) gave the range of the species as including most of the Atlantic seaboard north to the Lower Hudson River system in New York, but in his description of *L. tenuipes* he included a figure of the verge that appears aberrant when compared to specimens of *L. tenuipes* from farther south along the coast. On the basis of this aberrancy, THOMPSON (1968) concluded that the material examined by PILSBRY (1952) belonged to an undescribed species. THOMPSON (1968, 1984) subsequently listed coastal Georgia as the northern range limit of populations that he could confidently identify as *L. tenuipes*. This decision has been adopted by BURCH (1982) as well. Nonetheless, JACOBSON (1953) recorded the species from

the Chesapeake Bay region and BEETLE (1973) listed the species as occurring in coastal Virginia. Recently, M. Mazurkiewicz (personal communication) has examined specimens of *L. tenuipes* collected in New Jersey.

## RESULTS AND DISCUSSION

During the spring of 1986, specimens approaching the description of *Littoridinops tenuipes* were collected in two localities in the Parker River system in northeastern Massachusetts (Essex County). The two localities are (1) an open ditch just W of MA Rt. 1A, 0.3 km S of Newbury border, Rowley, and (2) a marsh off the Mill River just N of the Newbury-Rowley border and E of US Rt. 1, Newbury.

In the first locality, hundreds of specimens of *Littoridinops* were found associated with two other hydrobiid species, *Cincinnati winkleyi* (Pilsbry) and *Spurwinkia salsa* (Pilsbry), both of which were also abundant. No other mollusks were detected. The ditch contained cat-tails (*Typha* sp.) and unidentified rushes. The salinity level was 2.0‰ (oligohaline) as determined using a LaMotte Salinity Titration kit (Model POL-H). Elevation was about 3 m above sea level. The ditch drained an oak-alder-pine swamp on the E side of MA Rt. 1A.



Figure 1

Shell of *Littoridinops tenuipes* from the Parker River system in Massachusetts,  $\times 15$ .

At the second locality, mollusk species associated with *Littoridinops*, which was not common, were *Cincinnati winkleyi*, the freshwater pisidiid clam *Pisidium casertanum* (Poli), and pulmonate snails of the genus *Lymnaea* (species undetermined). The marsh was dominated by cat-tails (*Typha* sp.) and was, by its proximity to a tidal flat, undoubtedly affected by tidal water. At the time of collection the salinity measured 0.3‰ (freshwater).

All specimens collected alive were narcotized with menthol crystals and fixed in 10% formaldehyde. Specimens were subsequently stored in 50% isopropyl alcohol. With the exception of a small series of shells donated to the Museum of Comparative Zoology, Harvard University (MCZ296178), all specimens have been placed in the Invertebrate Division of the Museum of Zoology, University

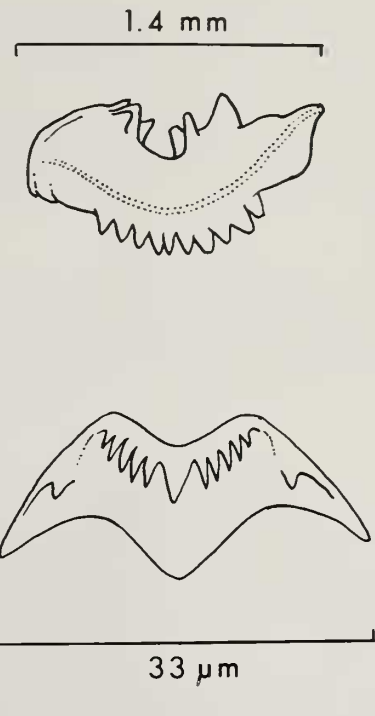


Figure 2

Morphology of the verge (a) and central tooth of the radula (b) of *Littoridinops tenuipes* from the Parker River system in Massachusetts.

of Massachusetts at Amherst (locality 1: UMA MO. 1593; locality 2: UMA MO. 1594).

Several morphological characters traditionally important in hydrobiid taxonomy were analyzed for purposes of comparison with the *Littoridinops* species described by PILSBRY (1952) and THOMPSON (1968). Shell measurements included shell length, shell diameter, aperture length, and aperture width (Table 1). The overall morphology of the shell (Figure 1) is distinctly littoridinine by nature of its relatively flat-sided whorls and shallow sutures (PILSBRY, 1952; THOMPSON, 1968, 1984). The operculum is paucispiral. The verge is also typical of *Littoridinops* in possessing a single lobe (penis) with a single duct (vas

Table 1

Shell and verge characteristics of Massachusetts populations of *Littoridinops*. R = range;  $\bar{X}$  = mean; n = sample size.

	Shell dimensions				Verge papillae		
	Shell length	Shell diameter	Aperture length	Aperture width	Left side	Right side	Base
R	3.29-5.39	1.89-2.66	1.26-1.89	0.98-1.61	2-5	7-13	0-4
$\bar{X}$	3.82	2.14	1.54	1.23	3.4	8.7	1.33
n	20	20	20	20	15	15	15

deferens) extending to the distal tip, an absence of specialized glands, but with characteristic papillae present along each side and the base (Figure 2a). The number and arrangement of papillae on the verge are given in Table 1. Additionally, radula preparations of ten specimens revealed no dental characters unlike those described and figured by PILSBRY (1952) and THOMPSON (1968) for the genus.

An assessment of three characters described above indicates that the Massachusetts populations of *Littoridinops* are referable to *L. tenuipes*. Shell dimensions (see Table 1) compare favorably with data presented by THOMPSON (1968:61) for *L. tenuipes* from Florida and Georgia. The only difference noted was a slight increase in shell size in Massachusetts specimens. The shell length-diameter and shell length-aperture length ratios for Massachusetts specimens were 1.61–2.03 and 2.07–3.00, respectively, and these values are overlapped completely by those of *L. tenuipes* from Florida and Georgia (THOMPSON, 1968). The morphology of the verge, including the arrangement and number of papillae on the verge, is the single strongest indicator of the taxonomic affinity of the Massachusetts populations. Clearly, the presence of papillae on both sides and at the base of the verge (Figure 2a) and the number of papillae in each group (Table 1) show no difference from *L. tenuipes* from the southeastern Atlantic coast. In examined individuals the papillae along the right side were fairly uniform in size and formed a single row, although occasionally a few proximal papillae overlapped slightly. Left side papillae were less uniform in size and were bunched together (Figure 2a) or were scattered somewhat along the border. Basal papillae were present in all but one individual in a sample of 15 specimens (Table 1) and were usually of different size and arrangement.

The radular teeth exhibited the greatest variation among the characters examined. In 10 preparations the lateral teeth contained, in addition to a mesocone, from four to six ectocones and from four to six entocones, somewhat higher numbers than the total cusp count (including the mesocone) given by PILSBRY (1952) or individual counts in THOMPSON (1968). The central tooth in Massachusetts specimens (Figure 2b) also showed some variation in cusp count with formula variations ranging from  $\frac{4-1-4}{1-1}$  to

$\frac{6-1-6}{2-2}$  (15 preparations). These formulae show no great deviation from those reported for *Littoridinops tenuipes* elsewhere.

Although it is evident that the Massachusetts populations examined in this study are identical with *Littoridinops tenuipes* when using traditional morphological characters, the question of the aberrant verge figured by PILSBRY (1952) for New York specimens is still unresolved. The specimens observed by PILSBRY (1952) may have been *L. tenuipes*, but the appearance of the figured verge may be the result of distortion due to preservation without prior relaxation. Alternatively, it could be argued that *L. tenuipes* occurs northward along the Atlantic coast to New England but that another undescribed species, with verge characters similar to those described by PILSBRY (1952), also exists in the region.

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